

EX PARTE OR LATE FILED

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of

Amendment of Section 90.239 of
the Commission's Rules to Adopt
Permanent Regulations for
Automatic Vehicle Monitoring
Systems

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RM-8013

TO: The Commission

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

EX PARTE COMMENTS

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INC. AND TEXAS INSTRUMENTS
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SUMMARY

MFS/TI fully supports an expeditious resolution of this proceeding and applauds the Commission's effort to achieve a compromise solution. Since the inception of this proceeding, MFS/TI has been concerned that the spectrum band plan initially proposed leaves too little contiguous spectrum to be shared by the multiple AVI providers. In an effort to reasonably accommodate all interested parties, MFS/TI initially proposed a compromise plan wherein only one 8 MHz segment would be devoted to the exclusive use of multilateration systems, leaving the remaining 18 MHz of contiguous spectrum to be shared by the numerous AVI systems.

The Commission is now considering a revised plan that attempts to accommodate the interests in this proceeding, particularly the multilateration operators and the Part 15 community. MFS/TI continues to believe that ample policy and technical reasons exist to require multilateration systems to share spectrum. MFS/TI's priority concern at this time, however, is to see a quick resolution of this proceeding. In the interest of bringing these protracted proceedings to a close as soon as possible, MFS/TI can support a plan that follows the Commission's new revised plan but incorporates MFS/TI's suggested minor revisions. In particular, in response to the revised plan now being circulated, MFS/TI proposes that the Commission adopt minor changes to its plan to gain the use of the 4 MHz of spectrum that is now virtually wasted on the edges of the 902-928 MHz band. The Commission should shift the 6 MHz exclusive use blocks 2 MHz toward the end so that the middle contiguous block to be shared by AVI systems can be stretched to 12 or 14 MHz (in a 6-14-6 MHz or 2-6-12-6 MHz configuration). If the Commission declines to adopt MFS/TI's suggested modifications and

decides to adopt its revised plan (with 10 MHz of contiguous spectrum in the middle), the Commission should be careful not to adopt special power limitations or other restrictions within that middle band that will severely impair AVI operations.

The proposal now being circulated goes a long way in striking an equitable and technically feasible balance. MFS/TI, however, herein suggests minor modifications to the proposed plan that it believes will achieve a reasonable compromise among the interested parties, that may be implemented expeditiously, and that serves important public interest considerations.

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EX PARTE COMMENTS

MFS Network Technologies, Inc. ("MFS") and Texas Instruments Incorporated ("TI") (hereinafter collectively referred to as "MFS/TI") respectfully submit these joint ex parte comments to address the revised proposal currently being considered informally among the interested parties in this proceeding and by the Commission. MFS/TI fully supports an expeditious resolution of this proceeding and applauds the Commission's effort to achieve a compromise solution. The proposal now being circulated goes a long way in striking an equitable and technically feasible balance. MFS/TI, however, herein suggests modifications to the proposed plan that it believes will achieve a reasonable compromise among the interested parties, that may be implemented expeditiously, and that serves important public interest considerations. In particular, the proposal, if modified as suggested by MFS/TI, will further the public interest in promoting efficient spectrum use, competition among service providers, competition between technologies, maintaining reasonable consumer prices, safer, more efficient public highways, and continued innovation in radio technologies.

I. INTRODUCTION AND SUMMARY

TI and MFS are among several leading companies in the automatic vehicle identification ("AVI") industry which supply, construct and operate intelligent highway systems that will pave the way for safer, congestion-free "smart highways." The customers for AVI-based Electronic Toll and Traffic Management ("ETTM") systems are state governments, highway, bridge, tunnel and toll authorities and other quasi-governmental entities charged with public responsibility over ensuring the efficiency, safety and funding of public vehicle transportation systems in this country.^{1/}

AVI systems are a vital segment of the automatic vehicle monitoring service or location monitoring services at issue in this proceeding. However, MFS/TI believe that in some respects, because the current, very vocal debate in the proceeding appears to have boiled down to a question of whether multilateration systems, such as AirTouch's system, will interfere with unlicensed Part 15 devices, the Commission and the other parties have overlooked the very significant concerns of the AVI industry and the important public interest benefits that AVI will deliver.

^{1/} The advent of AVI-based ETTM systems are consistent with the existing federal Intelligent Vehicle Highway System ("IVHS") initiatives. The Department of Transportation ("DOT") is currently funding several IVHS progress aimed at improving the efficiency of the country's surface transportation. Secretary of Transportation Pena has established the following goals for IVHS: to get the economy moving through strategic investments; to make travel safer, more convenient, and more human; to consider the environment in all transportation investments; to advance transportation technology and expertise; and to integrate all modes of transportation into a seamless system of moving goods and services. With these goals in mind, the DOT is presently involved in several significant IVHS-related activities, including the development of an overall national IVHS system architecture to ensure compatibility of deployed IVHS systems, a national program planning effort to ensure coordination and integration of public and private sector IVHS actions, and research projects and operational tests of IVHS applications.

Since the inception of this proceeding, MFS/TI has been concerned that the band plan initially proposed leaves too little contiguous spectrum to be shared by the multiple AVI providers.^{2/} The consequence of a plan that provides insufficient spectrum is to limit functionality, as well as capacity of AVI-based systems, thereby artificially suppressing this industry and denying American consumers the benefits of this important technology. In an effort to reasonably accommodate all interested parties, MFS/TI initially proposed a compromise plan wherein only one 8 MHz segment would be devoted to the exclusive use of multilateration systems, leaving the remaining 18 MHz of contiguous spectrum to be shared by the numerous AVI systems.

The Commission is now considering a revised plan that attempts to accommodate the interests in this proceeding particularly the multilateration operators and the Part 15 community.^{3/} MFS/TI continues to believe that ample policy and technical reasons exist to require multilateration systems to share a single block of 6 MHz or 8 MHz.^{4/} MFS/TI's priority concern

^{2/} The Commission's initial proposal would dedicate two 8 MHz blocks (904-912 MHz, and 918-926 MHz) for wide area multilateration systems.

^{3/} The revised plan is apparently designed to accommodate specific multilateration systems (currently represented by less than a handful of companies). Part 15 devices are accommodated by a proposed interference threshold that would apply only in the exclusive multilateration bands and a band plan that is designed to prevent licensed use in the lower 2 MHz band at 902-904 MHz.

^{4/} The record in this proceeding supports the Commission's initial conclusion that multilateration systems can share in an economically and technically feasible manner. Indeed, after initial protestations to the contrary, AirTouch conceded in its February 1994 Ex Parte filing that reasonable sharing rules could be established to permit wideband multilateration systems to share the same spectrum. In that filing, Airtouch explains one method it devised to share bandwidth other operators. MFS/TI believes that several cost-effective, technically feasible methods are available to accomplish sharing.

(continued...)

at this time, however, is to see a quick resolution of this proceeding. Accordingly, in the interests of bringing these protracted proceedings to a close as soon as possible, MFS/TI can support a plan that follows the Commission's new revised plan but incorporates MFS/TI's suggested minor revisions. In particular, in response to the revised plan now being circulated, MFS/TI proposes that the Commission adopt minor changes to its plan to gain the use of the 4 MHz of spectrum that is now virtually wasted on the edges of the 902-928 MHz band. The Commission should shift the 6 MHz exclusive use blocks 2 MHz toward the end so that the middle contiguous block to be shared by AVI systems can be stretched to 12 or 14 MHz. (in a 6-14-6 MHz or 2-6-12-6 MHz configuration.) If the Commission declines to adopt MFS/TI's suggested modifications and decides to adopt its revised plan (with 10 MHz of contiguous spectrum in the middle), the Commission should be careful not to adopt special power limitations or other restrictions within that middle band that will severely impair AVI operations.

II. THE REVISED PLAN

The Commission's "new" proposed plan is as follows:

The Band Plan: "2-6-10-6-2"

^{4/}(...continued)

A plan that includes sharing will not undermine the Commission's effort to achieve competition among multiple providers in the multilateration industry. Multilateration operators that share and coordinate their systems in the same band will not be any more likely to engage in anticompetitive practices or pricing schemes than multilateration operators operating in the same geographic area but in different spectrum bands. Of course, as is the case with all Commission licensed providers, any collusive behavior can be addressed by the antitrust division of the Department of Justice. Cooperation in coordination will be encouraged by the multilateration operators' mutual need to operate.

902-904	available for nonmultilateration systems on shared basis
904-910	multilateration systems exclusively
910-920	available for nonmultilateration systems on a shared basis
920-926	multilateration systems exclusively
926-928	available for nonmultilateration systems on shared basis

In the middle 10 MHz block, multilateration systems (such as Pinpoint's technology) would operate on a secondary basis to nonmultilateration systems. Part 15 devices could operate throughout the band but in the two 6 MHz multilateration blocks, the FCC would impose an interference threshold. In those bands, no interference from Part 15 devices will be recognized unless:

- A. The Part 15 device is using outdoor antennas which are more than 5 meters above ground, or
- B. The Part 15 device is using spread spectrum equipment that does not meet the June 1994 15.247(b) rules that revised the permissible power levels (regarding 6 dB antenna gain), or
- C. The Part 15 device is a field disturbance sensor operating under Section 15.245.

MFS/TI understands that the lower 2 MHz slice was designed to accommodate Part 15 field disturbance devices, the lower 6 MHz block accommodates existing multilateration (e.g., AirTouch's) systems, the middle 10 MHz block could be shared by all nonmultilateration systems, and the upper 6 MHz block was designed for other companies proposing to operate multilateration systems. No incumbent interest appears to exist in the upper 2 MHz slice. The secondary multilateration rule in the middle 10 MHz was designed to accommodate another specific prospective multilateration operator.

III. AVI-BASED TECHNOLOGY IS SPECTRUM EFFICIENT TECHNOLOGY THAT DOES NOT CONFLICT WITH PART 15 OPERATIONS

The record in this proceeding already contains ample material describing AVI technologies and, therefore, MFS/TI will not repeat that information here. However, since MFS/TI believes that certain key features of the current plan are not justified on technical grounds, it is worth clarifying the principle features of AVI technology vis-a-vis other users of the 900 MHz spectrum.

The AVI industry is comprised of multiple companies that offer multiple AVI technologies. AVI-based systems in the United States operate on the 902-928 MHz band. Because AVI systems operate only over very short distances and are highly spectrum efficient, they pose virtually no interference threat to other AVI systems or unlicensed Part 15 devices. Due to the relatively high power transmission of multilateration systems over a wide area, however, multilateration systems and AVI systems cannot share the same bandwidth in the same geographic area.

Another common feature among AVI technologies is the need for sufficient contiguous bandwidth to support full implementation. Certain first-generation systems have been implemented using relatively modest amounts of contiguous spectrum (e.g., 4-6 MHz). However, current design, development, manufacture and customer demand requires the use of greater contiguous spectrum.

Because AVI systems and Part 15 devices do not cause significant interference to each other, MFS/TI has no comment on the proposed Part 15 interference threshold. However, MFS/TI proposes that the Commission adopt certain modest modifications to its plan to achieve

more efficient spectrum use and ensure that the AVI industry is not unnecessarily precluded from developing the functionality and capacity being demanded of AVI-based systems. MFS/TI urges the Commission to expedite the close of this proceeding by adopting its revised plan but including the changes suggested below.^{5/}

IV. IF THE COMMISSION DECIDES TO DEVOTE 12 MHZ OF EXCLUSIVE SPECTRUM TO THE MULTILATERATION OPERATORS, IT SHOULD MAKE MINOR MODIFICATIONS TO THE BAND PLAN TO ALLOW THE MULTIPLE AVI SYSTEMS TO SHARE 12 OR 14 MHZ OF CONTIGUOUS SPECTRUM

Today's AVI systems have two requirements: 1) sufficient contiguous bandwidth in the 902-928 MHz band to accommodate operation and efficient roll-off, and 2) some flexibility in locating the center frequency of the spectrum block to avoid possible local interference that may be identified on-site upon final radiofrequency selection.

If the Commission will not require multilateration systems to share spectrum, it should seek to modify the band plan to more efficiently use the spectrum and provide more contiguous spectrum for AVI systems in the middle band. The current band plan inefficiently carves out two small bands of 2 MHz each at either end of the 902-928 MHz band. These wasted 4 MHz of spectrum appear to have no purpose, although it is possible that the lower 2 MHz is designed to grant special protected status to a specific Part 15 manufacturer of field disturbance sensors used in retail clothing stores. Given the severe spectrum shortage, the Commission should be

^{5/} Among other things, the absence of a Commission order in this proceeding has caused unnecessary confusion among AVI customers over whether the 900 MHz band (compared to much higher frequencies) is a viable spectrum band for AVI technologies.

careful to maximize spectrum use of the entire 902-928 MHz band. To that end, MFS/TI proposes that both proposed 6 MHz exclusive multilateration blocks, or at least one block be shifted 2 MHz toward the end so that a greater amount of contiguous spectrum will be left in the middle to be shared among the entire AVI industry. The suggested alternative would be a band plan of 6-14-6 (902-908, 908-922, 927-928 MHz) or, at a minimum, 2-6-12-6 (902-904, 904-910, 910-922, 922-928 MHz). This minor modification would provide contiguous bandwidth necessary for the AVI industry to meet the current and near-future demand for functionality and capacity.

From MFS/TI's perspective, it may be possible for AVI technologies to operate in as little as 10 MHz of bandwidth. Operation in that narrow range would, however, require that no power limits or other similar requirements are imposed by the Commission that would further restrict the ability of AVI systems to operate.

V. FURTHER STUDY IS NECESSARY TO DETERMINE WHETHER MULTILATERATION OPERATION ON A SECONDARY BASIS WILL INTERFERE WITH OR OTHERWISE DISRUPT AVI SYSTEMS OPERATING IN THE 902-928 MHZ BAND

As a part of the Commission's new plan, it proposes to permit multilateration systems to operate on a secondary basis to AVI nonmultilateration systems in the 910-920 MHz band. Under established Commission rules, secondary operation would require the multilateration operator to accept interference from the primary user, *i.e.*, nonmultilateration systems, and to cease any interference to and otherwise defer to the primary operation. Although this protocol would legally ensure that AVI nonmultilateration systems operating in the same area would have

priority over the spectrum, it is conceivable that multilateration use, even on a secondary basis, would prove to be unworkable in day-to-day operations.

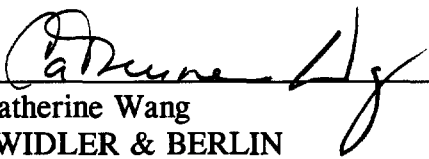
MFS/TI understands that one prospective multilateration operator, in particular, would be likely to operate, on a secondary basis in this band, i.e., Pinpoint Communications. At this time MFS/TI is not sufficiently familiar with the details of Pinpoint's technology or its operations to predict whether the Commission's proposal will present an untenable situation for nonmultilateration systems with primary use over the band. MFS/TI has already tasked its engineering staff to analyze these issues. At this time, however, MFS/TI is not in a position to confirm that it can accept secondary multilateration operation in the 910-920 MHz band. MFS/TI submits that the Commission also cannot yet adequately evaluate this issue. Therefore, MFS/TI urges the Commission to defer decision on this portion of its proposed plan until the parties have had sufficient time to consider the practical consequences to nonmultilateration systems. Given the proposal to devote a very generous 12 MHz of spectrum -- on a primary and exclusive basis -- to multilateration systems, deferral of the secondary-operation issue to provide time for adequate consideration will not be onerous or unduly restrictive on the multilateration industry. Indeed, to do otherwise would unfairly put the 10 MHz (or possible 12-14 MHz) of spectrum that is to be available for shared nonmultilateration and use at risk for no useful regulatory or public interest reason.

VI. CONCLUSION


For the reasons stated above, MFS/TI urges the Commission to adopt its revised plan as modified by MFS/TI's proposed minor changes. Further, the Commission should bring this proceeding to a close as expeditiously as possible to avoid further customer confusion in the AVI industry.

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